

ECOMORPHOLOGICAL FEEDING DIVERSITY IN PAST AND PRESENT VULTURE GUILDS

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Wherever there is a high diversity of sympatric vultures, competition for available carrion is likely to be intensified and differences in behavior and/or morphology may be expected. Morphological indices intended to reflect feeding capabilities among these specialized scavengers were analyzed from the cranium, beak, and mandible. A principal component analysis and a discriminant function analysis were used to determine the distribution of functional types of extant vultures from several regions where they occur in the greatest diversity: Amazonia, East Africa, South Africa, and India. These results were then compared with species from the Pleistocene Rancho La Brea tar pits in California to assess changes through time. Although there are phylogenetic differences between Old and New World vultures, there appears to be a similar array of functional types and body sizes among the different regions, suggesting competition is an important determinant of feeding morphology.

THE SWAINSON'S HAWK PRODUCTIVITY CRASH

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Swainson's hawks (*Buteo swainsoni*) were healthy and reproducing consistently well in western Saskatchewan from 1969 through 1987. Suddenly, trouble became apparent with six consecutive "bad" years in a row, the six worst in 25 yr. Decreased productivity became evident in both grassland pastures and croplands near Kindersley in 1988, but at Alsask only in 1992. By 1993 the number of nesting pairs at Kindersley was less than half of that found 10 yr previously, most pairs failed, and even the successful pairs raised only one young per nest. The decline began in drought years and accelerated in two wet years. Drastically decreased numbers of Richardson's ground squirrels (*Spermophilus richardsonii*), the hawk's main prey species, may in part be related to increased numbers of foxes (*Vulpes* spp.) and coyotes (*Canis latrans*). The hawk decline began 2 yr after the peak year of carbofuran use.

FALL MIGRATION ROUTES OF FOUR PEREGRINE FALCONS DESCRIBED BY SATELLITE RADIOTELEMETRY

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We attached satellite radio transmitters to four adult female peregrine falcons (*Falco peregrinus*) on their breeding

territories to describe their migratory routes and wintering areas. Two of the falcons were captured and radiotagged in July 1993 on the upper Yukon River in eastcentral Alaska. Two other falcons were captured and marked in August 1993 on Lake Powell in southern Utah and northern Arizona. The 27 g transmitters used were miniaturized versions of the 95 g PTT-100 design that has been used extensively to track large raptors. They were attached using neoprene backpack-style harnesses. To conserve battery power, the transmitters were programmed to transmit for 8 hr in a 128-hr cycle and are projected to transmit for 10 mo to allow documentation of wintering areas and spring migratory routes. The Yukon River falcons departed from their breeding territories in late August and early September and are currently in southern Florida and Honduras. The Lake Powell falcons departed their breeding territories in late September and are currently on the coast of western Mexico in the states of Sinaloa and Nayarit.

TERRITORIAL WITHDRAWAL EXPERIMENTS IN A POPULATION OF PEREGRINE FALCONS

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The results of a preliminary series of territorial withdrawal experiments conducted in a dense population of peregrine falcons (*Falco peregrinus*) around Rankin Inlet, N.W.T., Canada are reported. This represents the first experimental attempt to establish the presence of "floaters," non-breeding non-territorial adults, and the size of the floating component in a population of peregrine falcons. It is from this component of the population that birds are recruited to the breeding population when an available territory arises due to the death of one of the occupants, or when an increase in food supply is sufficient to sustain more breeding pairs in the population. Vacancies were created by trapping one of a breeding pair during the courtship period and holding it for up to 24 hr. Of nine withdrawals, six involved holding the male temporarily, three the female. All female vacancies were filled, and three out of six males were replaced during the observation period. All of the original territory holders, except for one female, subsequently regained their territories from the individual replacing it. None of the replacements could be accounted for by the movement of an individual from a neighboring territory. This initial series of withdrawal experiments provided interesting results while confirming the safety and feasibility of such experimentation. The completion of a future series of withdrawal experiments will help elucidate the role of spacing behavior in limiting the density of breeding populations of raptors.